ISOTOPES IN THE SUSTAINABLE MANAGEMENT OF WATER RESOURCES

(MOR/8/008) F4 New

MODEL PROJECT

CORE FINANCING

YEAR	Experts		Group Activity	Equipment	Fellowships		Scientific Visits		Group Training	Sub-Contracts	Misc. Comp.	TOTAL
	m/d	US $	US $	US $	m/d	US $	m/d	US $	US $	US $	US $	US $
1999	2/0	29,400	0	50,000	6/0	20,700	0/0	0	0	0	0	100,100
2000	2/0	30,900	0	60,000	6/0	21,600	0/15	5,700	0	0	0	118,200

First Year Approved: 1999

OBJECTIVES: To develop national capability in the use of isotopes for achieving sustainable exploitation of groundwater, thereby contributing to the optimal management of water resources in Morocco.

BACKGROUND: The scarcity of water is an important constraint to agricultural and industrial development in Morocco. There are three major problems: (1) the limited availability of water resources, which depend largely on an irregular rainfall pattern, (2) increasing demand for water owing to population growth, and agricultural and industrial expansion, and (3) the deteriorating quality of water due to pollution. Morocco has launched an extensive programme to exploit both surface water and groundwater to meet its demands for domestic (about 20%), industrial (about 10%) and irrigation (about 70%) purposes. Most of the demand is met through harnessing surface water by building dams. However, a total of four billion m3 of groundwater is extracted annually, of which 80% is used for irrigation. About 80 aquifers are used for groundwater extraction, 32 of which are deep (>200m). The declining water table in most of the aquifers is a problem area where the Agency can make a substantial contribution. Inadequate understanding of the groundwater system results in drilling dry wells, unsuccessfully trying to use shallow aquifers for drinking water, and drilling artesian wells with poor water quality. This project aims at improving sustainability of groundwater exploitation through underground hydrology studies using isotope techniques to evaluate the resources.

PROJECT PLAN: The project will be implemented by the General Directorate for Hydraulics (DGH) of the Ministry of Agriculture, Equipment and Environment, with the collaboration of the National Centre for Nuclear Energy, Sciences and Technology (CNESTEN). The TC project will be integrated with the national groundwater programme. Initially, isotopic investigations will be carried out in two regions. In the Beni Mellal area, the study will focus on the quantification of aquifer recharge, hydraulic interconnections between shallow and deep aquifers, and pollution levels in the shallow aquifers. In the Moulouya area, isotopic hydrology will be integrated in the national activity to characterize the aquifers. To begin with, some of the isotopic analyses will be carried out abroad. However, CNESTEN, which is acquiring a mass spectrometer and a liquid scintillation counter, will take over these activities by mid-1999, whereby the capabilities of the DGH and the CNESTEN will be upgraded through training and expert services.

NATIONAL COMMITMENT: The Government has recently launched a national programme to investigate all Moroccan aquifers over the next 10 years. The total budget allocated to this programme amounts to US $75 million. The first phase consists of a systematic investigation of various parameters and characteristics of two aquifers. DGH will undertake field activities, providing trained personnel, transportation, and an operational budget, and CNESTEN will provide the necessary resources to undertake the analytical work once the necessary infrastructure is established.

AGENCY INPUT: The Agency will provide expert assistance, training and analytical services to deal with immediate problems, while developing local capacity to use isotope hydrology techniques in the long run. Minor equipment items will also be purchased.

PROJECT IMPACT: In the proposed area of study near Beni Mellal, about 300 million m^3 of groundwater is extracted annually from an area of approximately 10,000 km^2. Little information is currently available on the aquifers in the Moulouya area, which is expected to be equally important. The project will provide useful data for sustainable exploitation of these resources, thus alleviating the problem of water shortage for municipal, agricultural and industrial uses.